

Some of the cocoons now exhibited contain a less amount of the spongy coating over the capsule than others, evidently showing that one of its uses is to supply nourishment during their imprisonment, for by placing one of these in the sun for a day or two, the young leeches penetrate the cocoon.

I may state, in conclusion, that my observations have extended over five years.

ART. IV.—*Diagnostic Notes on New or Imperfectly Known Australian Plants.* By DR. FERDINAND MUELLER.

[Read before the Institute 26th May, 1858.]

OLACINEÆ.

Ximenia exarmata.

GLABROUS, thornless; leaves herbaceous, ovate or oblong, almost blunt; peduncles generally 3-7-flowered, rarely 1-2-flowered; petals outside smooth.

On low stony ridges near the rivers Sutter and Mackenzie.

A tall shrub with spreading branches. Leaves flat, 1-2 inches, petioles 3-4 lines long. Petals lanceolate, yellowish, $2\frac{1}{2}$ lines long, inside white-bearded. Filaments hardly 1 line long, glabrous. Anthers $1\frac{1}{2}$ line long, linear. Style short, glabrous.

Evidently, according to Forster's brief description, allied to the New Caledonian *Ximenia elliptica*. The genus was previously unknown as Australian.

ERYTHROXYLEÆ.

Erythroxylon Australe.

Glabrous; stem shrubby; leaves small, obovate or oblong, cuneate, blunt, flat, opaque, nearly membraneous, with indistinct areolate veins, and a short petiole; their lower side paler; stipules membraneous, deciduous, as long or shorter than the leafstalk, combined into a solitary deltoid binerved one; peduncles as long as the flowers, solitary or in fascicles, at the base with two deltoid or round bracteols; lobes of the deeply five-cleft calyx deltoid lanceolate; petals ovate-orbicular; styles 3, rarely 4, free; stigmas hemispherical; drupe ovate, red, three-celled.

In the Brigalow Scrubs of East Australia, as far north as the Burdekin River.

A shrub several feet high, with compressed angulate branchlets. Leaves alternate or fasciculate, pale-green, 4-8 lines long. Calyx in æstivation valvate, one line long. Petals yellowish-green, as long as the calyx, with two ovate denticulate scales, $\frac{1}{4}$ line long, at the base. Anthers one-sixth of a line. Styles one line long. Drupe succulent, half an inch long.

The nearest related species seems *E. hypericifolium*. Its wood probably yields a dye like that of many of its congeners.

HIPPOCRATEÆ.

Hippocratea barbata.

Glabrous, climbing, leaves on rather short petioles, chartaceous, ovate, rarely lanceolate, blunt, repand-crenulate, much longer than the cymes; petals yellowish, lanceolate, five or six time longer than the calyx, inside above the middle bearded; anthers four-lobed.

On the banks of rivers near Moreton Bay. Hill and Mueller.

A tall climber. Leaves from $1\frac{1}{2}$ to 3 inches long. Flowers scented, with 5-6 petals. Anthers yellow. Style conical-subulate, green.

The plant is allied to *Hippocratea obtusifolia* and *pauciflora*, particularly in respect to its large flowers, but cannot be identified with any described Indian species. It is the only representative of the order hitherto discovered on this continent.

VINIFERÆ.

Cissus opaca.

(Sect. *Ampelopsis*.)

Shrubby; leaves palmate, often on long stalks, with 3-5 leaflets, which are herbaceous, oblong, or cuneate-lanceolate, rarely ovate or linear, entire or sometimes in front toothed, sessile, opaque, beneath glaucous; umbells in paniculate cymes; corolla three times longer than the calyx, green; style short: stigma depressed; berries black.

In the Brigalow scrub of Eastern Australia.

A tall vine, generally glabrous, sometimes slightly downy. It differs from *Cissus Australasica* (Transact. Phil. Soc.

Vict. I. p. 8, *C. hypoleuca* Asa Gray, in Wilk. United States Explor. Exped.) in its smaller neither leathery nor stalked leaflets and pentamerous flowers. On this apt occasion I am anxious to describe another Australian vine, mentioned already by Captain Stokes, which yielded in its young branches a pleasant acid antiscorbutic vegetable to Mr. Gregory's exploring party in North West Australia, viz.:—

Cissus acetosa.

(Sect. Ampelopsis.)

Erect, not climbing, herbaceous, soon glabrous; leaves pedate, consisting of from 5 to 9 herbaceous undotted leaflets; the lateral ones sessile on the secondary petiole and distant from the stalked middle one; all oblong or cuneate-obovate, blunt, mucronulate, entire or in front minutely crenate-denticulate, beneath paler; panicle compound, contracted; petals much longer than the calyx, inside dark purple; stigma sessile; berries ovate-globose, black.

Stems several feet high, not shrubby, rather succulent. Petioles short. Length of leaflets 4 inches or less. Stipules broad triangular. Petals 1 line, berries 3 lines long.

This remarkable plant forms the transit from *Cissus* to *Vitis*, differing from the latter genus in the solution of the petals, from the former in the absence of a style.

SAPINDACEÆ.

Arytera foveolata.

Branchlets, petioles and panicles more or less covered with a rust-brown velvet; leaflets 4-6 on short stalks, ovate or lanceolate-ovate, blunt, entire, or repand-dentate, glabrous, on both sides of almost equal colour, beneath at the base of each lateral nerve slightly bearded and furnished with a foveole; flowers small in wide racemose panicles; anthers almost velvety, cordate-ovate; carpels 2-4, beyond the base disconnected, broad-ovate, turgid, blunt; valves thick, coriaceous, outside velvety, inside glabrous; seeds nearly black, turgid, broad-ovate, perfectly involved in the arillus.

In the forests of Moreton Bay. Hill and Mueller.

A tall tree. Leaflets generally alternate, thin-coriaceous, 2-4 inches long, 1-1½ broad, with spreading nerves and numerous veins. Calyx shorter than one line, 5-cleft. Sta-

mens 6-8. Filaments very short, style rather thick, one line long, simple. Carpels 4-5 lines, seeds $2\frac{1}{2}$ lines long.

Arytera divaricata.

Branchlets, petioles, and panicles covered with a thin rust-brown velvet; leaflets 2-4 on short stalks, ovate or ovate-lanceolate, blunt, entire or slightly repand, glabrous, nearly of equal colour on both sides; panicles compound; carpels oblong, blunt, 2-3, beyond the concrete base divaricate, outside glabrous, inside densely tomentose.

In the woods around Moreton Bay. Hill and Mueller.

Similar to the preceding species. Flowers unknown, The immature carpels already 4-5 lines long, 2 lines and less broad, and considerably compressed.

Arytera semiglauca.

(*Nephelium semiglaucum*, Ferd. Muell. coll.)

Branchlets, petioles and panicles thin velvety, leaflets 2-4, almost sessile, ovate or lanceolate-ovate, blunt, entire, above glabrous, beneath glaucous and slightly downy, flowers small, in compound panicles; carpels 2-3, brown to the middle concrete, round-ovate, compressed, outside and inside glabrous; seeds brown, turgid, ovate, covered with a thin arillus.

In the forest near Moreton Bay. Hill and Mueller.

A middle-sized tree. Leaflets thin, coriaceous, $1\frac{1}{2}$ -3" long, with thin spreading nerves, veined; carpels about $\frac{1}{4}$ -inch long, tardily dehiscent, and sometimes also laterally bursting, for which reason the genus might be united with *Spanoghea*, and both again as subgenera with *Nephelium*. Seeds two lines long, shining, smooth, with fragile testa. Cotyledons a little bent. Radicule directed towards the hilum.

Spanoghea nephelioides.

(*Nephelium leiocarpum*, Ferd. Muell. coll.)

Nearly glabrous; leaflets 4-6, ovate-lanceolate, acuminate, entire beneath pale; flowers paniculate; style enclosed within the lobes of the fruit; carpels 2-4, almost globose, outward and inward glabrous, above the middle disjointed; seeds large, depressed-spherical, shining black, except the summit enclosed in a red cupular arillus.

In the forests near Moreton Bay. Hill and Mueller.

A middle-sized tree. Leaflets thin-coriaceous, with prominent spreading nerves and numerous anastomosing veins, 2-4 inches long, often alternate, contracted into a short petiole. Calyx persistent, puberulous, 5-parted in fruit, with ovate-lanceolate segments $\frac{1}{2}$ line long. Carpels measuring 3-4 lines, coriaceous, smooth, breaking irregularly transversely. Seeds $2\frac{1}{2}$ -3 lines in diameter, polished, with a fleshy acidulous arillus, the red colour of which contrasting beautifully with the black crustaceous testa. Endopleura fulvid, membranous. Cotyledons irregularly turned and folded. Radicula pointing to the hilum.

This genus, as mentioned before, might be referred to *Nephelium*, and includes the *Neph. tomentosum*.

Spanoghea connata.

(*Nephelium connatum*, F.M. coll.)

Leaflets 2-4, oblong or lanceolate-ovate, blunt, entire; beneath, as well as the branchlets, petioles, and panicles covered with a grey very thin velvet; flowers paniculate; style quite exerted; carpels 3-4, outside at last glabrous, connate into a depressed capsule, with blunt lateral lobes, downy inside; seeds small, shining-black, enclosed in a red, cupular arillus.

In wooded valleys near Moreton Bay. Hill and Mueller.

A tree 30 to 40 feet high. Leaflets thin-coriaceous 2-4 inches long, alternate or opposite, subsessile, above shining and glabrous, beneath opaque, with spreading nerves and netted veins. Fruit-bearing calyx short, with five deltoid lobes. Fruit about three lines long, 4-5 lines broad. Seeds measuring $1\frac{1}{2}$ line, depressed-globose. Arillus vividly red.

Harpulia pendula.

(Planchon in herbar. Kewens.)

Leaflets 2-6, chartaceous, glabrous, lanceolate-ovate, somewhat acuminate, entire; calyx deciduous; cells of the capsules as long as broad, inside glabrous.

In the forests near Moreton Bay.

Harpulia Hillii.

Branchlets and panicles covered with a thin rust-brown velvet; leaflets 2-12, coriaceous, glabrous, oval, blunt, entire; calyx persistent; cells of the capsule broader than long, inside tomentose, outside puberulous.

In the virgin forests of Durando. W. Hill.

A tree 60 feet high; leaflets sometimes, when fully grown, 8 inches long and 2 broad, above more intensely shining than beneath, obliquely tapering into a short petiole, with spreading nerves and netted veins. Panicle 6 inches or less long, simple. Pedicels often shorter than half an inch, with a basilar linear bracteole. Sepals imbricate in aestivation, broad ovate, 2-2½ lines long, outside and inside covered with a yellow-brown velvet. Petals 5, glabrous, oblong (white, according to Mr. Hill), 3 lines long; no scale at their base. Stamens 5, with very short filaments. Anthers sagittate, one line long. Hypogynous disc very short, sinuate, with velvety margin. Style 1 line long, smooth, at last twisted. Ovary velvety. Capsule heart or kidney-shaped, carnulent, coriaceous, vitellinous, turgid, about one inch broad, bursting along its vertex.

Cupani Onervosa.

Branchlets and panicles glabrescent; leaflets 2-7, lanceolate, acute, repand-denticulate or entire, without dots, with spreading prominent nerves, on both pages glabrous; flowers small, paniculate, apetalous; calyx small, repand-denticulate; capsule woody, roundish-trigonal, inside tomentose.

Along the Richmond River. C. Moore. About Moreton Bay. Hill and Mueller.

Leaflets 2-6 inches long, generally alternate, on short stalks, above shining, beneath opaque. Capsule ½-1 inch long.

Closely allied to the following species, still distinct.

Cupania xylocarpa.

(All. Cunningham's Herb.)

Branchlets and panicles almost velvety; leaflets 2-5, ovate, somewhat blunt, repando-denticulate or with remote sharp teeth, without dots, above glabrous, beneath at the base of the spreading prominent nerves bearded; flowers small, crowded in racemose panicles; calyx deeply five-cleft; stigma sessile; capsule woody, globose-trigonal, at last outward glabrous, inward velvety; seeds ovate, shining-black, three times longer than the pale bilobed arillus.

On various parts of the east coast of Australia.

A middle-sized tree. Tomentum thin, brown-yellow.

Leaflets generally alternate, thin-coriaceous, on very short stalks, above shining, below opaque. Calyx about one line long. Capsule measuring 8-10 lines, inside often purple. Seeds two lines long, slightly compressed, with a red arillus.

It appears nearer in its affinity to *C. subcinerea*, than to the other Australian species, viz.: *C. Pseudorchus*, *C. Cunninghami*, and *C. anacardioides*.

Besides these and the preceding noble sapindaceous trees, two species of *Schleichera*, and many others belonging to this order, occur along the humid east coast of Australia, all as evergreen with horizontal umbrageous foliage, highly adapted for avenues, unless trees of greater rapidity of growth were needed.

CELASTRINEÆ.

Denhamia.

(Meisn. gen. 18. *Leucocarpon* Ach. Rich. voy. de l'Astrolabe, II. 46. Sert. Astrol., 18, non Bridel.)

Calyx 5-cleft, persistent; lobes semi-ovate, as well as the corolla with imbricate præ-florescence. Petals 5, ovate, alternate, with the lobes of the calyx inserted beneath the disk. Stamens 5, opposite to the lobes of the calyx, inserted to the slightly sinuate disk. Filaments subulate-linear. Anthers cordate, affixed above the base, introrse, two-celled, bursting longitudinally. Stigmas 3, very short, sessile, somewhat clubshaped, long cohering into a cone. Ovules ascending in two rows along the septa. Capsule bony, with loculicidal dehiscence, 3-5 valved, 3-5 celled, or, through imperfect development of the dissepiments, one celled, few-or many-seeded. Seeds ovate, perfectly enclosed in the succulent arillus. Embryo straight, in the axis of a fleshy albumen. Cotyledons flat. Radicle very short, next to the hilum.

Smooth shrubs or small trees inhabiting the warmer parts of Australia, with alternate flat coriaceous ovate or lanceolate net-veined leaves, which are entire or toothed and destitute of stipules, and with small minutely bracteolate paniculate flowers.

Denhamia xanthosperma.

Branchlets almost terete; leaves lanceolate, acute or acuminate, with rather long petioles, entire, beneath pale from a powdery at last separating pellicle; flowers paniculate; filaments as long as the anthers;

capsule trivalved, one-celled, large; seeds yellow, many along each of the imperfect septa.

In dry plains and rocky declivities of Arnhem's Land.

A tall shrub or small tree, with generally pendulous branchlets. Leaves pale green, $1\frac{1}{2}$ -3 inches long, one-nerved. Panicles axillary, or terminal, often not as long as the leaves; secondary peduncles angular, generally cymose. Pedicels about as long as the calyx, with deltoid lanceolate bracteoles at the base. Lobes of the calyx $\frac{1}{2}$ line long. Petals pale greenish-yellow, smooth, $1\frac{1}{2}$ line long. Filaments measuring only $\frac{1}{2}$ line. Anthers almost white. Ovary globose-ovate, imperfectly three-celled. Capsule ovate or nearly globose, $1-1\frac{1}{2}$ inch long, shining yellow, with three slight furrows, smooth. Dissepiments very narrow, with eight or less seeds to each, which are ovate, 3-4 lines long, and perfectly involved in a beautifully red arillus. Testa wrinkled-papillose.

Denhamia heterophylla.

Branchlets almost terete; leaves ovate or lanceolate, acuminate, entire or acutely toothed, or both pages of equal colour, provided with conspicuous petioles; flowers paniculate; filaments as long as the anthers; capsule 3-5-valved; seeds black, one or a few on each septum.

On scrubby ridges from the Gilbert River to the Burdekin River.

Similar in almost every respect to the preceding species. Bark grey, wrinkled. The leaves are as variable as in some of the *Capparis* species, resembling in the young plants those of *Xylomelum*. Hence this tree occurs under that name in Dr. Leichhardt's journal, and in D. C., prod. xiv., p. 422, adnot. Capsule pale orange, arillus red.

Denhamia oleaster.

(*Melicytus*? *Oleaster*, Lindl. in Mitch. Trop. Austr., p. 383.)

Branchlets nearly terete; leaves linear- or narrow-lanceolate, tapering into a short petiole; flowers racemose; filaments longer than the anthers; style short, cylindrical.

On the Balonne River. Sir Th. Mitchell.

A shrub several feet high. Leaves pale green, $1\frac{1}{2}$ - $2\frac{1}{2}$ inches long, $\frac{1}{3}$ - $\frac{1}{2}$ inch broad, acute. Racemes on short peduncles. Lobes of the calyx semiovate, ciliate, $\frac{1}{2}$ line long. Petals white, nearly 2 lines long. Filaments exceeding

somewhat 1 line in length. Anthers cordate. Style 2 thirds of line long. Stigma minute trilobed.

Denhamia pittosporoides.

Young branchlets angular; leaves oblong-lanceolate, gradually tapering into a short petiole, crenate denticulate, on both pages of equal colour; capsule small, four-valved, four-seeded, perfectly four-celled.

In the Araucaria Ranges on the sources of the Burnett River. C. Moore.

Leaves more intensely green and stronger veined than in any of its congeners, 2-4 inches long, 6-10 lines broad. Calyx normal. Valves of the capsule about $\frac{1}{2}$ inch long, as well as the dissepiments bony.

To Mr. Black, the intelligent keeper of the Hookerian Herbarium, I am indebted for identifying the two first species of this genus with *Leucocarpon*, an information which, without reference to authenticated specimens, hardly could have been obtained, since Richard described the fruit as sub-carnose. Mr. Black even believes, that *Denhamia xanthosperma* is identical with *Leucocarpon obscurum*; but the latter being found on the sub-tropical Eastern coast, and the former only hitherto on the fall of the waters to the north coast, I deem it preferable to hold the two distinct, until flowering specimens are procured of the *Leucocarpon* from the locality mentioned by Richard. *Denhamia Oleaster* and *D. pittosporoides* are too imperfectly known to render their position in this genus certain. I have referred all these plants to *Celastrineæ*, since the flowers seem to point out a closer alliance to that order than to *Bixaceæ*. If this view be adopted, the genus *Denhamia* will be placed near *Putterlickia*.

Celastrus Cunninghami.

(*Catha Cunninghami*, Hook. in Mitch. Trop. Austr., p. 387. Sect. *Catha*.)

Unarmed, glabrous; leaves scattered, coriaceous, lanceolate or narrow-linear, entire or rarely towards the apex denticulate; pedicels axillary, solitary, fasciculate-racemose, or rarely paniculate; capsules small, obovate, turgid, bivalved, one-celled, one seeded; seeds ovate-globose, shining-black, enclosed in a pulpy arillus.

From Port Jackson (where it was found by W. Woolls, Esq.), extending as far as North-west Australia.

A tall shrub, or small tree, with black wrinkled bark and numerous branchlets. Leaves $1\frac{1}{2}$ - $2\frac{1}{2}$ inches long, 1-6 lines broad, generally acute, gradually narrowed into the base, veined; the floral ones deciduous, leaving thus frequently a racemose inflorescence. Sepals nearly orbicular, $\frac{1}{2}$ line long. Petals ovate or round, pale greenish-yellow, twice as long as the calyx. Filaments very short, inserted to the outside of the disk. Anthers basifixed, ovate-cordate, $\frac{1}{4}$ line long. Stigma subsessile, bilobed. Ovary two-celled. Seeds $1\frac{1}{2}$ line long, neither compressed nor angulated.

Celastrus dispermus.

(Sect. Catha.)

Unarmed, glabrous; leaves thinly coriaceous, scattered, broad or lanceolate-obovate, entire, paler beneath; racemes lateral and axillar, few or many-flowered; calyx four-cleft; capsule obcordate-ovate or roundish, bivalved, compressed, two-celled, two- rarely four-seeded; seeds ovate, brown, only at the base covered with a thick fleshy arillus.

In the Araucaria Forests, near Moreton Bay.

A small tree similar to the following species; capsules about 3 lines long, rarely three-valved; seeds a little longer than one line.

Celastrus bilocularis.

(Sect. Catha.)

Unarmed, glabrous, leaves scattered, thin-coriaceous, ovate or broad-lanceolate, obscurely crenulate or sharp-teethed, distinctly net-veined, below paler; racemes axillary and lateral; capsule small, bivalved, ovate-globose, slightly compressed; cells one- or two-seeded; seeds enclosed in a thin arillus.

On the shrubby banks of the rivers Dawson and Burnett.

A small tree; leaves mostly $1\frac{1}{2}$ -2 inches long; capsules 2 lines long.

With Catha I refer also the genera Eucentrus and Polycanthus again to Celastrus. Besides the Celastrus Australis and the above-described celastrinaceous plants, I am acquainted with several other Australian ones belonging to this order, none of which, however, has been obtained in a state sufficiently perfect for description.